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ABSTRACT

This training package explains productivity in terms of the difference between worker output and company input. Output is defined in terms of the products and/or services of an organization (number and/or quality of units produced, efficiency of time use, marginal profits) and in terms of behavior (labor turnover, disruptions in routine, wasted production, and work-related accidents). Next, input is defined in terms of wages, fringe benefits, and expenditures on training. Procedures for identifying an output problem and conducting a performance appraisal interview are outlined. The following strategies to encourage workers to increase their productivity are discussed: making working conditions more pleasant; providing such options as participative management, flextime, and job rotation; forming project teams and quality circles; and tying promotions and increases in fringe benefits to increases in productivity. A glossary and set of transparency masters are included. (MN)

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# PRODUCTIVITY: AN OVERVIEW

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PRODUCTIVITY

"You don't have the right attitude!"

"Don't you understand the importance of being here on time?"

"You have to sell, not take orders!"

Strange as it may seem, these statements are expressions of productivity.

Productivity - what is it? There is no single set of measures or indicators that all businesses or organizations can use to measure their productivity. Different measuring devices are used in different situations. However, most people recognize that productivity should be thought of in terms of a ratio: "output of goods and services produced or generated by an organization divided by the input costs used to produce them.

$$\frac{\text{output of goods and services}}{\text{input (resources expended by the company)}} = \text{rate of productivity}$$

It stands to reason that to increase the rate of productivity, you should <u>increase output</u> OR <u>decrease input</u> OR <u>both</u>.

<u>OUTPUT</u>

There are many ways to measure the output of an organization. The measurement technique one will use will depend on the products or services that the organization produces. For example, the output of a sales force can easily be measured by the number and value of products it sells for a given period. The productivity of an office would be shown as the number of pieces of correspondence, reports, memorandum, etc., it produces. An automobile manufacturer measures the output of his/her workers by the number of cars turned out on the assembly line. One retailer[1], a dry cleaner defines productivity as "always keeping busy", "getting the work out on time".

As our economy becomes more cost conscientious, employers are looking for very specific ways to increase the output of their employees, your output. Some of the ways output can be increased are:

1) Increasing the total numbers of units produced
2) Reducing wasted products
3) Making the use of employee's time more efficient
4) Bettering the quality of each unit of output.

Output can be expressed also in terms of behavior. Output can be increased by:

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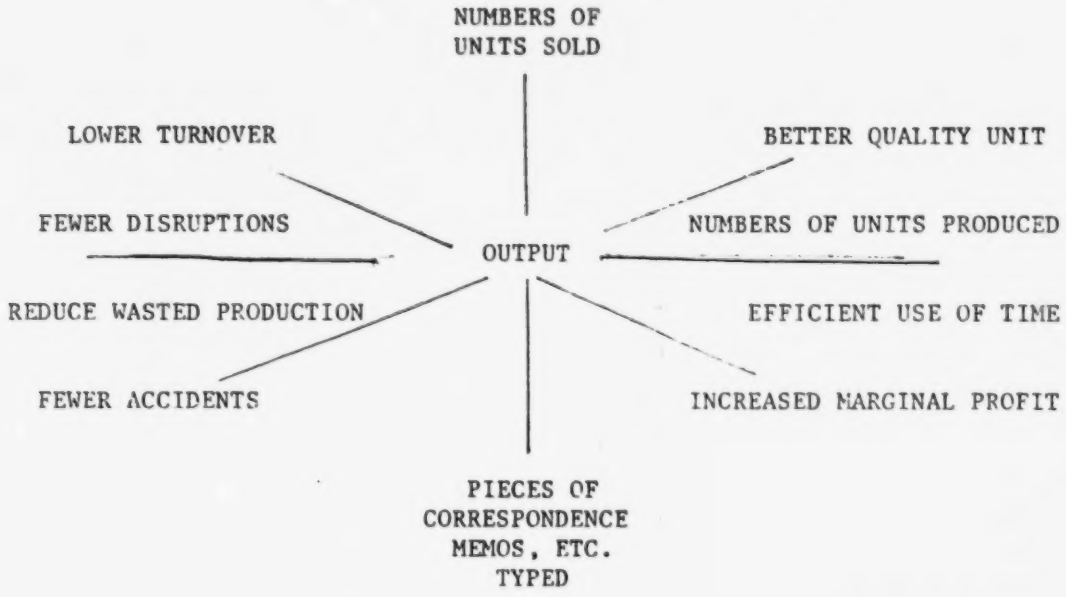
[1]Max Rosen, Columbia Cleaners, Willimantic, CT

1) Reducing the "turnover rate" of workers
2) Reducing tardiness and/or absenteeism
3) Reducing accidents
4) Reducing disruptions like "strikes", "slowdowns", grievance and "sabotage".

Each of these measures of output can increase amounts of profit gained or lost as a result of changes in productivity.

SOME FACTORS OF OUTPUT



INPUT - What the employee receives to complete the job assignment.

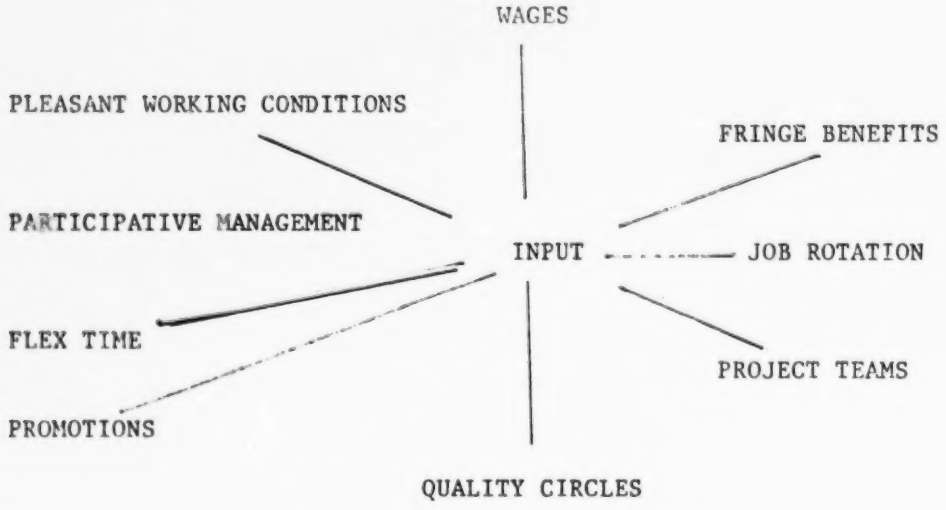
Most input is easy to measure because we are familiar with inputs like wages or salary, commissions, bonuses, vacation pay, sick leaves, etc. This type of input is called financial input and translates into the amount of money an organization is willing to give its employees for their output. Financial inputs represent major transactions a company is willing to trade for output. There are, however, many other kinds of inputs that are not so easily identified but are still costly.

Employers have begun to design input systems based on better human relationships; the idea is to make people more satisfied doing their jobs. If the workplace is maintained as a clean, bright, safe and learning-oriented environment, (a company must invest INPUT to make all of this happen) then the eventual results will be greater output. The theory is when people are happier, they will work harder.

Examples of human relations input programs that companies use include "job enrichment" which redesigns dull work to make it interesting. A type of job enrichment, "job rotation" encourages an employee to learn as much about his/her job and the jobs around him/her in order to get a variety of work and to change jobs with fellow workers on a regular basis. This insures a better opportunity for promotion or a raise. (For example, a payroll clerk might also learn to do the bookkeeping for Accounts Receivable or Purchasing enabling him/her to have a more interesting job and break the routine.) Another example of job enrichment is Project Teams which combine people with different abilities into teams to get a job done or to solve a problem. There is a mutual sharing of talents which leads to a great deal of satisfaction on the job and to increased productivity. Business and Industry have adopted the term "Quality Circle" to describe a group of employees who have combined their specific talents to satisfy a need or solve a problem.

Another input measure companies have introduced is called "participative management". This measure recognizes that employees are responsible for their actions and should have a say in deciding what their production goals are going to be; examples of participative management include (1) employee opinions and suggestion programs, (2) flex time, which allows employees a chance to choose the hours they want to work. (For example, the company may require that everyone work a seven hour day and that they must be at work between the hours of 10 and 3, however, the employee gets to decide what time he/she wants to come to work [8-10] and what time to go home [3-5] in order to make up a seven hour day.) The input by companies in the area of human relations techniques, it is felt, will make employees happier and will result in greater productivity. Thus non-financial input programs can offer motivation to increase output.

SOME FACTORS OF INPUT




IDENTIFYING AN OUTPUT PROBLEM

Your boss says to you "You are not doing what you are suppose to be doing!" The problem we are about to describe shows what happens to output when a difference in performance expectations exists. All the input (financial or human relations) factors in the world will not change behavior (output) unless both employees and employers match desired performance with the actual performance. If your performance does not match what is expected of you then ask yourself these questions:

1) What, exactly, am I suppose to be doing?
2) Do I need more training? What kinds?
3) What is the real difference between what I am doing, and what I am being asked to do?
4) Am I doing poorly? (because I am dissatisfied?)
5) What happened that cause me to believe things are not right?

How would you solve this problem?

The Performance-Appraisal Interview

Laura Louise has worked at Honeyriver Corporation for six months as an electronics assembler trainee. She is one of 600 employees on the night shift and performs a very routine assembly task on the line. Her supervisor, Martha Lynn, considers Laura an above-average performer who has an average absentee record. Laura is 19 years of age and is working to meet college expenses. Martha has noticed that Laura appears to become bored rather easily on the job and may have an attitude problem. However, during breaks Laura is very social and appears to have a high need to interact with her coworkers. Martha is planning the six-month

performance-evaluation interview with Laura and has some apprehensions about the meeting.

QUESTIONS

1. Role-play the performance-appraisal interview between Laura and Martha.
2. Why may Martha fear the meeting?
3. Why is Laura bored with her job?
4. Do you see a future for Laura at Honeyriver? Explain your answer.

## MARGINAL PRODUCTIVITY

Here's another way to measure whether or not a person's input equals his/her output.

Economists measure the value of a persons output by means of marginal productivity. Simply defined, marginal productivity is the value of the output you get from another person added to your workforce. For example, suppose one person could load seventy boxes (70) of apples into a truck in an hour - that's 560 boxes per 8 hour day. You decide to hire a second person to help do the loading and between the two people they load 1200 boxes of apples per day.

The first worker loaded 560 boxes of the 1200 boxes loaded per day. The second worker loaded 640 boxes more than when there was just one worker, bringing the total to 1200 boxes. The Marginal Product of the second worker is 640 boxes (now go back and reread the definition.)

Look at this example and try to determine the marginal product for a third worker and fourth worker.

| NO. OF WORKERS | BOXES LOADED | MARGINAL PRODUCT |
|---|---|---|
| 0 | 0 | 560 |
| 1 | 560 | 640 |
| 2 | 1200 | ? |
| 3 | 1900 | ? |
| 4 | 2650 | |

If you concluded that the MP[2] of the third worker was 700 boxes and the MP of the fourth worker was 750 boxes - you were correct. Each of the MP total shows us the amount of output in units each additional worker is contributing. Try doing this example; this time we will define output in terms of sales written.

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[2]Marginal Product

| NO. OF WORKERS | SALES WRITTEN | MARGINAL PRODUCT |
|---|---|---|
| 0 | 0 | |
| 1 | 15 | |
| 2 | 32 | |
| 3 | 50 | |
| 4 | 70 | |
| 5 | 91 | |
| 6 | 104 | |
| 7 | 109 | |

---

ANSWERS:

| | | |
|---|---|---|
| 0 | 0 | 15 |
| 1 | 15 | 17 |
| 2 | 32 | 18 |
| 3 | 50 | 20 |
| 4 | 70 | 21 |
| 5 | 91 | 23 |
| 6 | 104 | 5 |
| 7 | 109 | — |

Let's place a $5 value on each one of the sales written in this example. (The gross profit each sales will bring back to the company can tell the dollar amounts each person's labor is worth). Again, assume that each sales has a value of $5 in gross profit to the company.

The value of each workers MP looks like this:

| NO. OF WORKERS | SALES WRITTEN | MARGINAL PRODUCT (IN TERMS OF # OF SALES) | | INDIVIDUAL VALUE OF EACH SALE | TOTAL VALUE OF THE INDIVIDUAL MP @ $5/UNIT |
|---|---|---|---|---|---|
| 0 | 0 | 15 | X | $5 | $75 |
| 1 | 15 | 17 | X | $5 | $85 |
| 2 | 32 | 18 | X | $5 | $90 |
| 3 | 50 | 20 | X | $5 | $100 |
| 4 | 70 | 21 | X | $5 | $105 |
| 5 | 91 | 23 | X | $5 | $115 |
| 6 | 104 | 5 | X | $5 | $25 |
| 7 | 109 | - | | - | - |

Workers 1-7 have all expressed a positive output in terms of the numbers of units produced, also each worker has made a contribution to the profit of his/her company as a result of his/her OUTPUT.

Now let's see what happens when we place a value on the INPUT for each worker. Suppose that we pay each person $50 a day in salary plus $10 a day in fringe benefits (life insurance, social security premiums, health insurance premiums, etc.) The total INPUT paid by the company is $60 per day for the output of each worker. Can you guess which worker's output does not match his/her input in the previous example?

When we subtract the INPUT cost ($60 per day per worker) from the profit the company gains from the MP of each worker, it looks like this:

| NO. OF WORKERS | SALES WRITTEN | MARGINAL PRODUCT (IN TERMS OF # OF SALES) | TOTAL VALUE OF THE INDIVIDUAL MP @ $5/UNIT | MINUS INPUT COSTS | = ACTUAL AMOUN OF OUTPUT $ GAINED FROM THE WORK OF EACH PERSON |
|---|---|---|---|---|---|
| 0 | 0 | 15 | $75 | $60 | $15 |
| 1 | 15 | 17 | $85 | $60 | $25 |
| 2 | 32 | 18 | $90 | $60 | $30 |
| 3 | 50 | 20 | $100 | $60 | $40 |
| 4 | 70 | 21 | $105 | $60 | $45 |
| 5 | 91 | 23 | $115 | $60 | $55 |
| 6 | 104 | 5 | $25 | $60 | -$35 |
| 7 | 109 | *- | - | - | - |

*This is where the MP of the 8th worker would go if there were one.

Each person was contributing output, however, the output of the 7th worker (his MP) was only worth $25 (5 units @ $5) and the 7th workers MP failed to equal the company's input (salary & fringes) worth $60. Worker seven's lack of ability of initiative, her/his failing to meet basic job demands cost the company $35 in profit. Worker seven must be either retrained, reassigned or dismissed from the job because of poor productivity (i.e., output not equalling input).

Summary

What all this discussion means is that in order for any business or other organization to grow it must have employees who are willing to exceed or at the very least match their output with company input. Here are some suggestions worth considering:

1) Higher salaries are linked directly to higher productivity - Produce!

2) Increase understanding of your work to increase your chances for promotion (i.e., Let your added output get more rewards or input for you.)

3) Improve knowledge and application of new methods and technology

4) Be aware of the goals and standards set up by your company and work toward them

5) Be receptive to what others can teach you.

Companies trade financial and non-financial inputs in exchange for quality work and dependable workers (output). How much money would you trade for a hour of your time?

Let's place a $5 value on each one of the sales written in this example. (The gross profit each sales will bring back to the company can tell the dollar amounts each person's labor is worth). Again, assume that each sales has a value of $5 in gross profit to the company.

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*This is where the MP of the 8th worker would go if there were one.

## GLOSSARY

PRODUCTIVITY - the ratio between input and output OR what's left over after you pay costs

INPUT - resources a company expends to get productivity

OUTPUT - goods or services received as a result of worker efforts

TURNOVER - the number of terminated employees divided by the total work force

COMMISSIONS - the percentage of sales paid as compensation

FINANCIAL INPUT - all monetary compensations to workers

JOB ENRICHMENT - programs which attempt to humanize work and motivate employees

JOB ROTATION - a systematic plan for switching workers from one complementary job to another

QUALITY CIRCLES - an ad hoc, task-oriented group of non-management personnel whose function is to solve a particular problem

PARTICIPATIVE MANAGEMENT - decision making is shared by both the manager and personnel

FLEX TIME - reassigning hours in the work day based on the individual needs of employees

WORK STANDARDS - minimum levels of acceptable performance on the job

MARGINAL PRODUCTIVITY - the amount of additional production you get by adding another unit of labor to the job

MARGINAL PROFIT - the additional profit you gain from the labor of one additional worker added to the workforce (value of MP - Cost of Labor = Marginal Profit)

TRANSPARENCIES MASTERS

| NO. OF WORKERS | SALES WRITTEN | MARGINAL PRODUCT |
|---|---|---|
| 0 | 0 | |
| 1 | 15 | |
| 2 | 32 | |
| 3 | 50 | |
| 4 | 70 | |
| 5 | 91 | |
| 6 | 104 | |
| 7 | 109 | |

---

ANSWERS:

| | | |
|---|---|---|
| 0 | 0 | 15 |
| 1 | 15 | 17 |
| 2 | 32 | 18 |
| 3 | 50 | 20 |
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|---|---|---|
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SOME FACTORS OF INPUT

WAGES

PLEASANT WORKING CONDITIONS

FRINGE BENEFITS

PARTICIPATIVE MANAGEMENT

INPUT

JOB ROTATION

FLEX TIME

PROJECT TEAMS

PROMOTIONS

QUALITY CIRCLES

SOME FACTORS OF OUTPUT

NUMBERS OF
UNITS SOLD

LOWER TURNOVER

BETTER QUALITY UNIT

FEWER DISRUPTIONS

NUMBERS OF UNITS PRODUCED

OUTPUT

REDUCE WASTED PRODUCTION

EFFICIENT USE OF TIME

FEWER ACCIDENTS

INCREASED MARGINAL PROFIT

PIECES OF
CORRESPONDENCE
MEMOS, ETC.
TYPED

$$\frac{\text{output of goods and services}}{\text{input (resources expended by the company)}} = \text{rate of productivity}$$